

Review for Final – Third Installment

Be able to describe the electromagnetic spectrum.

Be able to describe the wave and particle behaviors of light.

Be able to describe the difference between frequency and intensity of light on the photoelectric effect

What is the energy of red light that has a wavelength of 750 nanometers?

What is the frequency of a photon that has  $5.68 \times 10^{-19}$  J of energy?

Be able to determine what colors are produced from color addition (light) and from color subtraction (pigments).

Describe an image created by a plane mirror.

A positive/negative (circle one)  $H_i$  means the image is virtual.

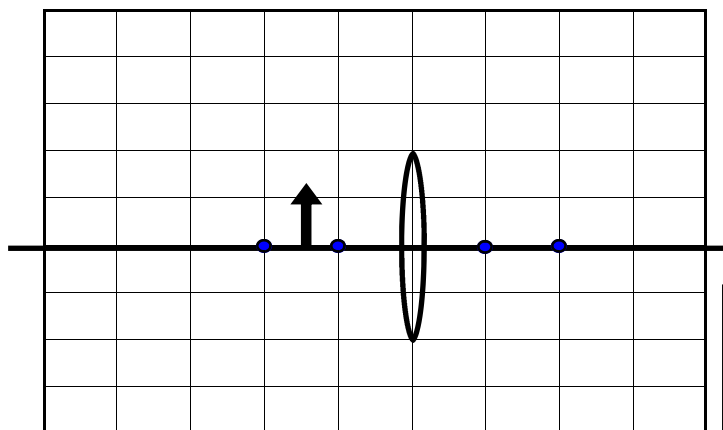
A positive/negative (circle one)  $D_i$  means the image is real.

When a light wave travels from a more optically dense medium to a less optically dense medium it is refracted towards/away from (circle one) the normal.

The critical angle for total internal reflection in Lucite is 41 degrees. Find Lucite's index of refraction.

What is the angle of refraction of a beam of light that enters the surface of a lake at an angle of incidence of 50 degrees? ( $n_{\text{water}} = 1.33$ )

The speed of light in a certain type of glass is  $1.91 \times 10^8$  m / s . What is the index of refraction of the glass?

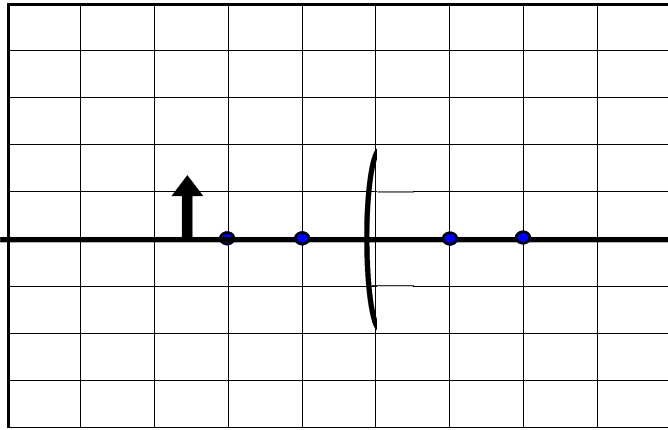


Mini .....	<input type="checkbox"/>	Real .....	<input type="checkbox"/>
Max .....	<input type="checkbox"/>	Virtual.....	<input type="checkbox"/>
Same .....	<input type="checkbox"/>	Upright.....	<input type="checkbox"/>
		Inverted.....	<input type="checkbox"/>

The object is located 15 cm from the lens having a focus of 10 cm.

Where is the image?

How tall is the image if the object is 5 cm tall?



Mini .....	<input type="checkbox"/>	Real .....	<input type="checkbox"/>
Max .....	<input type="checkbox"/>	Virtual.....	<input type="checkbox"/>
Same .....	<input type="checkbox"/>	Upright.....	<input type="checkbox"/>
		Inverted.....	<input type="checkbox"/>

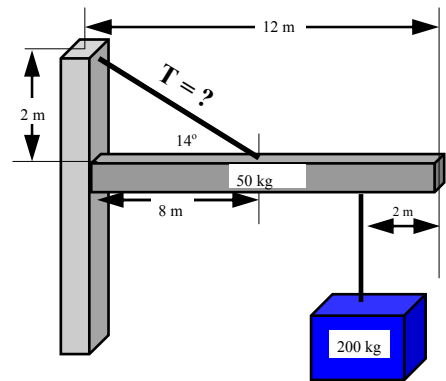
The object is located 15 cm from the mirror having a focus of 6 cm.

Where is the image?

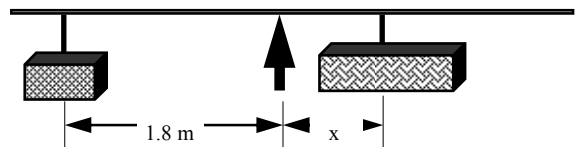
How tall is the image if the object is 1 cm tall?

What is torque? How is the sign of torque determined?

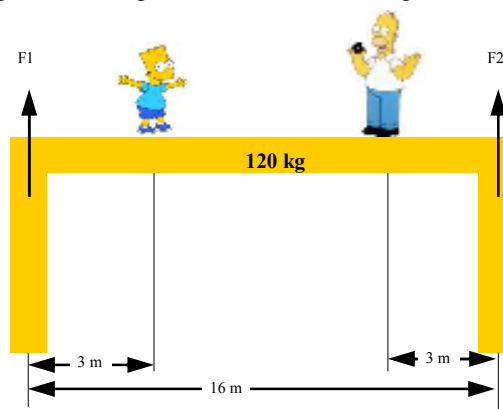
Calculate T,  $F_{wallx}$ , and  $F_{wally}$  using the picture provided. The mass of the shelf is 50 kg.



The rod which has a mass of 3 kg and a length of 4 meters is supported at its midpoint. The box on the left has a mass of 22 kg and the box on the right has a mass of 34 kg. What is the force fulcrum? How far from the midpoint is the 34 kg box hanging if the system is in static equilibrium?



A uniform 120 kg beam supports a 20 kg Bart Simpson and an 80 kg Homer Simpson as shown in the diagram below. What are the values of F1 and F2?



The following list is meant to help focus your studies from your NOTES.

Speed of Light	Color Addition	Color Subtraction	Electromagnetic Radiation
Primary Colors	Pigments v. Lights	Complementary colors	Polarization
Refraction	Diffraction	Mirrors	Reflection
Snell's Law	Critical Angle	Internal reflection	Law of Reflection
Photon	Photoelectric effect	Dual nature of light	Index of Refraction
Concave lens	Convex lens	Concave mirror	Real image
Absorption spectra		Torque	Convex mirror
			Virtual image
			Emission spectra

Some formulas and constants you MAY want to review:

**Light and Color:**

$c = f\lambda$                        $c = 3 \times 10^8 \text{ m/s}$                        $E = hf$                        $h = 6.63 \times 10^{-34} \text{ J}\cdot\text{s}$

**Mirrors and Lenses:**

$n = c/v$                        $n_{\text{air}} = 1$

$n_1 \sin \theta_i = n_2 \sin \theta_r$

$\sin \theta_c = n_2 / n_1$

$1/D_i + 1/D_o = 1/f$

$-(D_i)/D_o = H_i/H_o$

**Statics**

$\tau = rF$

How to study:

Review the math and the concepts on these sheets.

If there is one section that was more difficult than the others spend more time on it. Don't forget to bring your NOTES and your CALCULATOR to the final.

**GOOD LUCK!!!!**